

## REMARKS

Claims 6-8 and 14-16 remain for further consideration.

The rejections shall be taken up in the order presented in the Official Action.

2-3. Claims 6-8 and 14-16 currently stand rejected for allegedly being obvious in view of the combined subject matter disclosed in U.S. Patent 6,366,927 to Meek et al. (hereinafter "Meek"), U.S. Patent 6,438,494 to Yamamoto et al. (hereinafter "Yamamoto"), and U.S. Patent 5,610,815 to Gudat et al. (hereinafter "Gudat").

### Claim 6

Claim 6 recites a vehicle navigation system that receives sensor data from a plurality of sensors, and provides a map image that is presented on a display. The system includes:

“a navigation map data memory that includes map data indicative of roadways stored in Cornu spiral form and data indicative of a unit Cornu spiral; and

a navigation processing unit that receives the sensor data, and requests map data from the navigation map data memory associated with the sensor data, and computes the map image from the map data,

where terms of polynomials of the unit Cornu spiral are stored in the navigation map data memory and the map image is computed using the terms of polynomials of the unit Cornu spiral, where the terms of polynomials are associated with Taylor series expressions indicative of the Cornu spiral, where the Cornu spiral is of the form  $l = Ka^2$ , where  $l$  is indicative of arc length and  $K$  is indicative of curvature.” (cl. 6).

The Official Action recognizes that “*Meek et al. do not disclose a cornu spiral curve.*” (Official Action pg. 3). The Official Action then contends that “*however, Meek et al. disclose roadways stored geographic features that are other-than-straight form, for example, Bezier curve. straight line segment approximation to a curve in a geographic database, and the Bezier curves can*

*closely approximate circular curve (column 6, lines 35-41). The curving geographic feature is reproduced on the display by drawing straight lines from shape point to shape point starting and ending with the end points (column 4, lines 6-8). Therefore, the control points of the Bezier curves can be manipulated to become a cornu spiral or clothoid curve, because it is well known that cornu spiral or clothoid is a mathematical representation of a transition from a straight line to a curve. And also, it is well known by mathematicians, cornu spiral is a curve also generated by a computable function, as a means of describing the shape of a series of points by a specifying the coefficients of a polynomial equation.” (emphasis added; Official Action pg. 3).*

It is respectfully submitted that the contention in the Official Action noted above that “the curving geographic feature is reproduced on the display by drawing straight lines from shape point to shape point starting and ending with the end points (column 4, lines 6-8)” (Official Action pg. 3) does not teach a roadway or other similar cartographic parameters or features being displayed in curved form. Instead, this portion of Meek explicitly discloses in the prior art how a curve is represented using a series of straight lines segments. (Col. 3, line 48 to col. 4, line 17; FIGs. 3-4). Meek even discusses the shortcomings with such a straight line representation of a curved feature; for example, the increased data storage requirements for storing the starting and end points of each straight line segment that is part of the curve represented. (Col. 4, lines 42). Immediately following this contention, the Official Action concludes that “therefore, the control points of the Bezier curves can be manipulated to become a cornu spiral or clothoid curve, because it is well known that cornu spiral or clothoid is a mathematical representation of a transition from a straight line to a curve.” However, it is submitted that it cannot be properly concluded from the disclosure of a prior art representation of a curve using straight line segments

that therefore a Bezier curve, disclosed in Meek to represent a curved feature (roadway), can have its control points manipulated to become a cornu spiral. That is, using straight line segments each defined by starting and end points to define a curved feature does not teach or suggest to one of ordinary skill to manipulate the control points of a Bezier curve to become a cornu spiral. The conclusion does not logically flow from the contention of a curve represented by straight line segments. As a result, Meek fails to provide a proper reason, teaching or suggestion to modify the Bezier curve of Meek based upon the combined teachings of Meek, Yamamoto and Gudat to arrive at a Cornu spiral.

Further, the contention in the Official Action that Yamamoto discloses “*a clothoid curve (Cornu Spiral)*” which is a transition from a straight line to a curve, fails to provide a sufficient reason as to why a person of ordinary skill in the art would have combined Meek, Yamamoto and Gudat to arrive at the claimed invention.<sup>1</sup> Meek is concerned with a navigation system, and specifically with Bezier curves to represent curved map features (see, e.g., Abstract). On the other hand, Yamamoto is concerned with a method and apparatus for designing roads and has nothing to do whatsoever with navigation systems. (see, e.g., Abstract). Thus, Meek and Yamamoto are concerned with two very different purposes. As a result, the mere mention of a cornu spiral in Yamamoto in the context of designing roads fails to teach or suggest the use of such a cornu spiral for navigation systems. That is, a person of ordinary skill in the art of navigation systems would NOT look to a reference such as Yamamoto that deals with designing roads. Nothing in the reasoning given in the Official Action for combining Meek, Yamamoto and Gudat overcomes this inherent problem: “*Yamamoto et al. disclose to use the curvature*

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<sup>1</sup> See Memorandum, dated May 3, 2007, from Margaret A. Focarino, Deputy Commissioner for Patent Operations, to Technology Center Directors regarding the Supreme Court decision on *KSR Int'l Co., v. Teleflex, Inc.*, where it is emphasized that “*therefore, in formulating a rejection under 35 U.S.C. §103(a) based upon a combination of*

*transition curves on highly standardized roads, and clothoid curves or cornu spiral curves are usually used as the curvature transition curves (column 1, lines 18-23).*” (Official Action pg. 5).

Thus, the combination of Meek, Yamamoto and Gudat fails to disclose the use of a cornu spiral in a navigation system. As a result, Meek, Yamamoto and Gudat are not properly combinable.

Further, with respect to the contention in the Official Action noted above that “*also, Gudat et al. disclose navigation processing unit computes map image using clothoid polynomial coefficients stored in navigation map data memory, and terms of polynomials of the unit are stored in navigation map data memory and map image is computed using terms of polynomials coefficients (see at least columns 10-11, lines 40-18; columns 31-32, lines 49-49; columns 33-35, lines 54-25; columns 35-37, lines 54-21; and columns 60-61, lines 12-49)*” (Official Action pgs. 4-5), a careful inspection of these cited sections of Gudat noted above (i.e., columns 10-11, lines 40-18; columns 31-32, lines 49-49; columns 33-35, lines 54-25; columns 35-37, lines 54-21; and columns 60-61, lines 12-49) fails to reveal any disclosure or suggestion of the features of “*navigation processing unit computes map image using clothoid polynomial coefficients stored in navigation map data memory, and terms of polynomials of the unit are stored in navigation map data memory and map image is computed using terms of polynomials coefficients.*” Instead, these sections of Gudat are concerned with the history and development of GPS systems (col. 10, line 40 to col. 11, line 18) and various aspects of the clothoid curve (e.g., “clothoid path segments” in col. 31, line 49 to col. 32, line 49). These cited sections of Gudat fail to disclose or suggest features of claim 6 such as a “navigation map data memory”. Therefore, Gudat cannot be properly combined with Meek and Yamamoto to render claim 6 obvious. In light of the

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***prior art elements, it remains necessary to identify the reason why a person of ordinary skill in the art would have combined the prior art elements in the manner claimed.***”

foregoing, it is respectfully submitted that the obviousness rejection of claim 6 be withdrawn and claim 6 passed to allowance.

**Claim 7**

Since claim 7 currently stands rejected for the identical reasons as claim 6 as set out in the Official Action on pages 6-10, the arguments above with respect to the patentability of claim 6 apply to the patentability of claim 7.

**Claim 8**

Since claim 8 currently stands rejected for the same reasons as claim 7, the arguments above with respect to the patentability of claim 7 apply to the patentability of claim 8.

**Claim 14**

Since claim 14 currently stands rejected for the same reasons as claim 6, the arguments above with respect to the patentability of claim 6 apply to the patentability of claim 14.

**Claim 15**

Since claim 15 currently stands rejected for the same reasons as claim 7, the arguments above with respect to the patentability of claim 7 apply to the patentability of claim 15.

**Claim 16**

Since claim 16 currently stands rejected for the same reasons as claim 7, the arguments above with respect to the patentability of claim 7 apply to the patentability of claim 16.

For all the foregoing reasons, reconsideration and allowance of claims 6-8 and 14-16 is respectfully requested.

If a telephone interview could assist in the prosecution of this application, please call the undersigned attorney.

Respectfully submitted,

A handwritten signature in cursive script that reads "Patrick O'Shea". The signature is written in dark ink and is positioned above a horizontal line.

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